



Missouri Department of
NATURAL RESOURCES

Michael L. Parson, Governor

dnr.mo.gov

Carol S. Comer, Director

June 26, 2020

Jim Gulliford
Regional Administrator
U.S. EPA, Region VII
11201 Renner Boulevard
Lenexa, KS 66219

Re: 2020 Annual Ongoing Data Requirements Report for SO₂

Dear Jim Gulliford:

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) is submitting the state's stand-alone annual ongoing data requirements report pursuant to the federal data requirements rule for the 2010 1-hour sulfur dioxide (SO₂) standard. The annual ongoing data requirements report is due to the U.S. Environmental Protection Agency (EPA) on July 1, 2020, to meet the reporting requirements in 40 CFR 51.1205 (b).

The 2020 report addresses six areas where modeling of actual SO₂ emissions served as the basis for designating the areas as attainment/unclassifiable in EPA's Federal Register notices on July 12, 2016, for Scott County and on January 9, 2018, for the remaining five areas in the report. The air program recommends that no additional modeling is needed for all six attainment/unclassifiable areas based on the technical analysis in the attached ongoing report.

As required in 40 CFR 51.1205, the air program is making this final stand-alone report available for public inspection and review on our website. The air program also accepted comments on a draft of the report from May 15, 2020, to June 15, 2020. The air program did not receive any comments on the draft report, and the air program did not make any amendments to it.

Thank you for your attention to this matter. If you have any questions regarding the report, please contact Ms. Emily Wilbur, with the Department's Air Pollution Control



Jim Gulliford
Page Two

Program at P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-7840
or email at emily.wilbur@dnr.mo.gov.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Darcy A. Bybee
Director

DAB: fcc

Enclosure: 2020 Annual Ongoing Data Requirements Report

c: File# 2020-SO2-DRR-1

2020 Annual Ongoing Data Requirements Report

Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard



**Submittal Due Date
July 1, 2020**

**Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
P.O. Box 176
1659 East Elm Street
Jefferson City, Missouri 65102
Telephone 573-751-4817**

Purpose and Background

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) has prepared this report as the state's stand-alone annual ongoing data requirements report for the 2010 1-hour sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS). This report is intended to fulfill the annual reporting requirements of the federal SO₂ data requirements rule (DRR), 40 CFR Part 51 Subpart BB, "*Data Requirements Rule for Characterizing Air Quality for the Primary SO₂ NAAQS*". According to the rule, the air program must submit the annual ongoing data requirements report to the U.S. Environmental Protection Agency (EPA) on July 1 each year to meet the reporting requirements in 40 CFR 51.1205 (b):

"(b) Modeled areas. For any area where modeling of actual SO₂ emissions serve as the basis for designating such area as attainment for the 2010 SO₂ NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator by July 1 of each year, either as a stand-alone document made available for public inspection, or as an appendix to its Annual Monitoring Network Plan (also due on July 1 each year under 40 CFR 58.10), that documents the annual SO₂ emissions of each applicable source in each such area and provides an assessment of the cause of any emissions increase from the previous year. The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation.

(1) The air agency shall include in such report a recommendation regarding whether additional modeling is needed to characterize air quality in any area to determine whether the area meets or does not meet the 2010 SO₂ NAAQS. The EPA Regional Administrator will consider the emissions report and air agency recommendation, and may require that the air agency conduct updated air quality modeling for the area and submit it to the EPA within 12 months."

On July 12, 2016¹, EPA designated Scott County, Missouri as attainment/unclassifiable for the 2010 SO₂ standard based on EPA's technical assessment of the air program's submittals regarding the air quality surrounding the Sikeston Power Station and the rest of Scott County. The air program's analysis was based on modeling of actual SO₂ emissions (initially based on 2012-2014 data, updated using 2013-2015 data) from sources in and around Scott County. Further, EPA designated Jasper, Henry, Greene and Randolph Counties, as well as a portion of St. Louis County as attainment/unclassifiable for the 2010 SO₂ standard in 2018². The 2018 designations for these five additional areas were also based on modeling analyses the air program performed utilizing actual SO₂ emissions. Therefore, these six modeled areas are subject to the ongoing verification requirements under 40 CFR 51.1205 (b).

¹ See 81 FR 45039, July 12, 2016. Two other areas in Missouri were designated as unclassifiable at the same time; however, the annual ongoing report requirements of 40 CFR 51.1205 (b) do not apply to unclassifiable areas.

² 83 FR 1098, January 9, 2018

The air program submitted the first annual report for the Scott County modeled area to EPA in 2017. The report the air program submitted in 2019 was the first report that included the additional five areas in Missouri that EPA designated attainment based on air dispersion modeling of actual emissions. This 2020 report is the fourth annual report the air program has developed and includes an assessment of all six modeled areas in the state.

2019 Annual Emissions

Per 40 CFR 51.1205 (b), the air program is required to document the annual SO₂ emissions of all modeled DRR sources. Table 1 lists the six modeled DRR sources in Missouri and details their respective annual actual SO₂ emissions in 2019. The air program acquired emission data from EPA's Clean Air Markets Division (CAMD) database, which is based on Continuous Emissions Monitoring System (CEMS) data measured in compliance with 40 CFR Part 75.

Table 1 – 2019 Actual Annual SO₂ Emissions for Missouri's Modeled DRR Sources

| DRR Facility Name | County Name | DRR Facility FIPS | 2019 SO ₂ Emissions (tons) |
|----------------------------|-------------|-------------------|---------------------------------------|
| Meramec | St. Louis | (189-0010) | 1,395 |
| Asbury | Jasper | (097-0001) | 798 |
| Montrose | Henry | (083-0001) | 0 |
| Sikeston | Scott | (201-0017) | 3,668 |
| City Utilities John Twitty | Greene | (077-0039) | 1,558 |
| Thomas Hill | Randolph | (175-0001) | 16,697 |

Comparison of 2019 Emissions to Previous Year

Per 40 CFR 51.1205 (b), the air program is required to provide an assessment of the cause of any emissions increase from the previous year for all modeled DRR sources. Table 2 provides the 2018 and 2019 actual annual SO₂ emissions for the six modeled DRR sources along with the difference in annual emissions between the two years. As seen in the table, emissions increased from 2018 to 2019 at two of the six sources. These two facilities include Asbury (facility FIPS 097-0001), and Thomas Hill (facility FIPS 175-0001). These increases are highlighted in the last column of Table 2. For the other four facilities, actual SO₂ emissions reduced from the year 2018 to the year 2019.

Table 2 – 2018 and 2019 Emissions Comparison for Missouri's Modeled DRR Sources

| DRR Facility Name | 2018 SO ₂ Emissions (tons) | 2019 SO ₂ Emissions (tons) | 2018-2019 Comparison* |
|----------------------------|---------------------------------------|---------------------------------------|-----------------------|
| Meramec | 3,346 | 1,395 | -1,951 |
| Asbury | 739 | 798 | 59 |
| Montrose | 1,548 | 0 | -153 |
| Sikeston | 4,261 | 3,668 | -593 |
| City Utilities John Twitty | 3,147 | 1,558 | -1,589 |
| Thomas Hill | 16,201 | 16,697 | 496 |

*A positive value in the last column indicates an increase in emissions from 2018 to 2019; a negative value indicates a decrease in emissions from 2018 to 2019.

Assessment of Annual Emission Increases from 2018 to 2019

As stated above, the air program must provide an assessment of the cause of any emissions increase from the previous year for the modeled DRR sources. As shown in Table 2 above, annual SO₂ emissions increased at the Asbury and Thomas Hill facilities from 2018 to 2019. To provide this required assessment, the air program evaluated the cause of the annual emissions increases at these two facilities.

These two facilities are coal-fired power plants that provide electricity to the grid for sale to their customers. Year-to-year emission fluctuations at these types of facilities are common due to utilization rates as power generators operate to follow electricity demand, which varies every year. Additionally, in some years, units come down for weeks or months for routine maintenance, which can also add variability to the emissions in any given year. To determine whether this year-to-year variability in electricity production at these two facilities was the cause of the emissions increases, the air program obtained the annual operating hours and gross load produced by the units at these facilities in 2018 and 2019 from EPA's CAMD database. Table 3 provides this information for each unit at these two facilities along with the facility totals for these figures. The following sections provide the air program's assessment of the cause of the emissions increases at these two facilities from 2018 to 2019.

Table 3 - Operating Hours and Gross Load for 2018 and 2019 at Asbury and Thomas Hill

| Facility Name | Year | Unit ID | Operating Time (hours) | Operating Time (facility combined – hours) | Gross Load (MW-h) | Gross Load (facility combined – MW-h) |
|----------------------|-------------|----------------|-----------------------------------|-------------------------------------------------------|------------------------------|--------------------------------------------------|
| Asbury | 2018 | 1 | 5,580 | 5,580 | 941,901 | 941,901 |
| | 2019 | 1 | 5,532 | 5,532 | 922,789 | 922,789 |
| Thomas Hill | 2018 | MB1 | 7,963 | 22,916 | 1,239,928 | 8,245,588 |
| | | MB2 | 7,207 | | 1,827,784 | |
| | | MB3 | 7,744 | | 5,177,875 | |
| | 2019 | MB1 | 7,675 | 23,060 | 1,178,988 | 8,592,558 |
| | | MB2 | 7,013 | | 1,751,398 | |
| | | MB3 | 8,370 | | 5,662,171 | |

Thomas Hill – Assessment of 2018 to 2019 Annual Emissions Increase

From 2018 to 2019, the actual annual SO₂ emissions from this facility increased by 3 percent. This corresponds to an increase of 496 tons of SO₂ emissions between the two years. As seen in Table 3 above, both annual operating hours and gross load produced by the facility also increased between these two years. Based on this information, the year-to-year variability in electricity production at the facility is the cause of the annual SO₂ emissions increase from 2018 to 2019.

Asbury – Assessment of 2018 to 2019 Annual Emissions Increase

From 2018 to 2019, the actual annual SO₂ emissions from this facility increased by 7 percent. This corresponds to an increase of 59 tons of SO₂ emissions between the two years. As seen in Table 3, the operating hours and gross load produced by the facility in 2018 were higher than in 2019. This means the emissions increase cannot be attributed to year-to-year variability in electricity production at the facility.

Instead, the annual SO₂ emissions increase was due to a series of malfunctions occurring at the facility that had adverse affects on the capture efficiency of the SO₂ scrubber. During the month of February 2019, the Asbury power plant suffered from various malfunction issues associated with the scrubber. Problems were resolved within a few days, but emissions during this month exceeded MATS standard of 0.2 lbs./MMBtu (30-day rolling average). Similarly, during the month of May 2019, the plant reported excess emissions stemming from another scrubber system malfunction. This event caused excess emissions due to a longer startup of the scrubber system following the planned spring maintenance outage. Additionally, in June 2019, the plant was briefly shut down and restarted the next day and during this restart, the scrubber malfunctioned, resulting in an exceedance of the SO₂ standard for a two-hour period. Based on the air program's review, these combined issues are largely responsible for the annual SO₂ emissions increase of 59 tons at the Asbury facility from 2018 to 2019.

Recommendation Regarding Updated Modeling

In addition to the assessment of the annual SO₂ emissions fluctuations for each modeled DRR source, 40 CFR 51.1205 (b)(1) requires the air program to provide a recommendation in this annual report as to whether additional modeling is needed to characterize air quality in the areas surrounding all modeled DRR sources to determine whether the areas continue to meet the 2010 SO₂ standard. Based on the information and assessment set forth below, the air program recommends no updated dispersion modeling analysis is needed for any of Missouri's modeled DRR sources.

In determining the appropriate recommendation regarding the need for any updated dispersion modeling analysis, the appropriate assessment should compare emission characteristics in the most recent year with the emission characteristics that were modeled for the DRR sources to inform their initial attainment designations. Factors for consideration in such a comparison may include total annual emissions, the level of the modeled design value from the initial modeling analysis, other relevant facility-specific information, and where appropriate, hourly emission profiles or daily maximum 1-hour emission rates.

The air program's assessment to determine the appropriate recommendation regarding the need for updated modeling first evaluates the average annual emission totals that were modeled for the six DRR sources. The air program then compared these values against the actual annual emissions from 2019 for the same sources. In the modeling used to inform the initial designations, the modeled emissions from Missouri's six modeled DRR sources demonstrated compliance with the 2010 SO₂ standard. Therefore, if actual emissions in the most recent year are lower than the modeled emissions, it is reasonable to assume any updated modeling analysis utilizing the lower emission levels from the more recent year would also demonstrate compliance

with the standard.

Table 4 shows the average annual modeled emissions, the modeled design values, and the modeled emission years used to inform the initial attainment designations for the six modeled DRR sources. The table also provides the 2019 actual emissions for these six facilities and a comparison of the 2019 emissions to the average annual modeled emissions. For all six of Missouri's modeled DRR sources, except for Thomas Hill (see the increase for this facility highlighted in yellow in the last column of Table 4), the 2019 actual emissions are less than the average annual modeled emissions used to inform the initial attainment designation (either 2012-2014 or 2013-2015, as applicable). Therefore, any additional modeling for the five sources where emissions in 2019 were less than the modeled emissions would likely result in lower maximum-modeled design values than those listed in Table 4. This supports a recommendation for no updated modeling at these five sources.

Table 4 – Modeled Design Values and Comparison of Modeled Emissions to 2019 Actual Emissions for Missouri's Modeled DRR Sources

| DRR Facility Name | Maximum Modeled Design Value (ppb) | Years of Modeled Emissions Data | Average Annual Modeled SO ₂ Emissions (tons) | 2019 Actual SO ₂ Emissions (tons) | Comparison - Modeled Emissions vs. 2019 Emissions (tons)* |
|-------------------------------|------------------------------------|---------------------------------|---------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|
| Meramec | 52.98^ | 2013-2015^ | 5,541^ | 1,395 | -4,146 |
| Asbury | 67.5 | 2012-2014 | 6,695 | 798 | -5,897 |
| Montrose | 49.1 | 2013-2015 | 7,203 | 0 | -7,203 |
| Sikeston | 35.7 | 2013-2015 | 5,802 | 3,668 | -2,134 |
| City Utilities John Twitty | 42.9 | 2013-2015 | 2,759 | 1,558 | -1,201 |
| Thomas Hill | 52.1 | 2013-2015 | 16,582 | 16,697 | 115 |

* A positive value in the last column indicates the 2019 emissions were higher than the average annual modeled emissions; a negative value indicates 2019 emissions were lower than the average annual modeled emissions.

[^] The 2013-2015 average annual modeled emissions at Meramec in this table only include the average actual emissions from Units 3 and 4 during these three years. The 2013-2015 modeling performed for designations for the Meramec facility utilized 2013-2015 actual emissions from Units 3 and 4 and natural gas combustion in Units 1 and 2. An enforceable permit condition required exclusive use of natural gas in Units 1 and 2, effective starting in 2016.

The following discussions include facility-specific details considered in developing the air program's recommendations regarding the need for additional modeling for all six of Missouri's modeled DRR sources.

Sikeston, Scott County - FIPS (201-0017)

For this facility the 2019 annual SO₂ emissions were 2,134 tons/year less than the average annual modeled emissions from 2013-2015. Since annual emissions in 2019 were lower than the emissions used in the modeling analysis that demonstrated attainment, any updated modeling using the emissions from the year 2019 is expected to result in even lower modeled SO₂ concentrations that would also demonstrate continued attainment in the area surrounding this

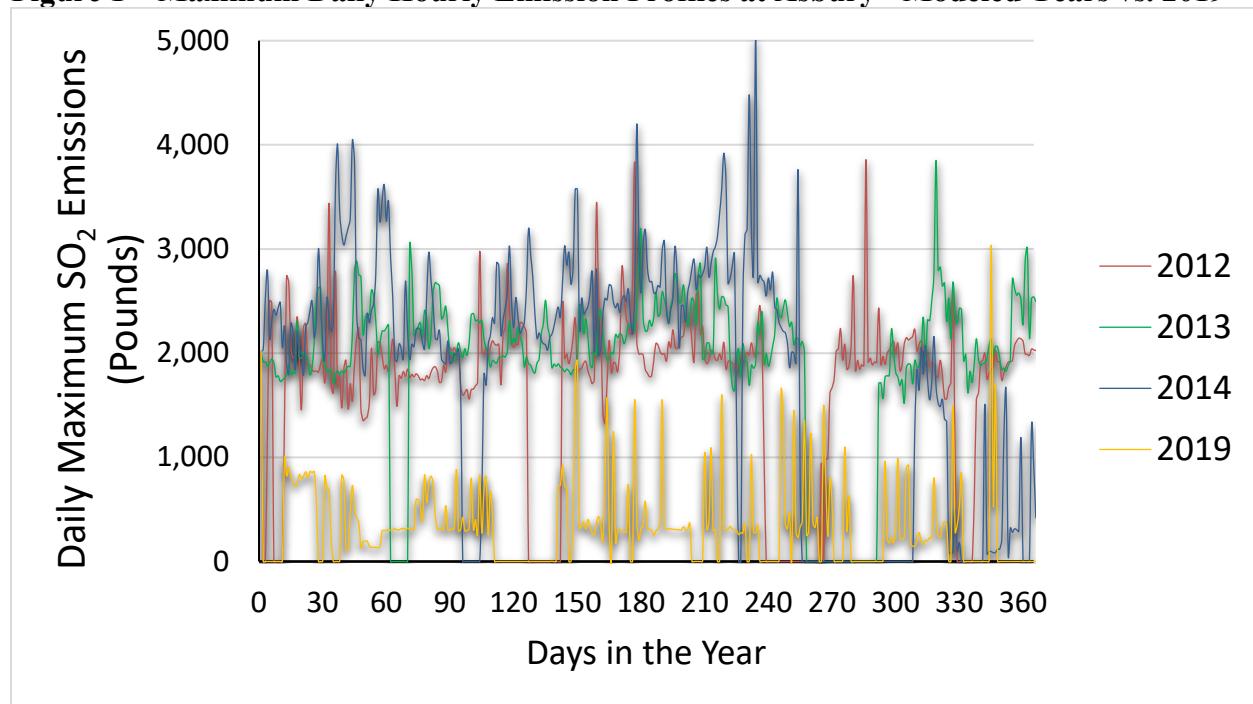
source. Therefore, the air program recommends no additional modeling for the area surrounding the Sikeston facility.

Asbury, Jasper County - FIPS (097-0001)

For this facility, annual SO₂ emissions in 2019 were 5,897 tons/year less than the average annual modeled emissions from 2013-2015. This is a decrease of 88 percent between current actual emissions and the emissions the air program modeled to inform the original attainment designation. Since annual emissions in 2019 were much lower than the emissions used in the modeling analysis that demonstrated attainment, any updated modeling for the emissions from 2019 is expected to result in even lower modeled SO₂ concentrations that would also demonstrate continued attainment in the area surrounding this source. However, as stated in the discussion above, a series of malfunctions at the facility led to an annual emissions increase at the facility from 2018 to 2019. This could have caused daily or hourly emissions to spike in a way that could negatively affect the hourly SO₂ concentrations in the area that are used to compare to the standard. Therefore, the air program performed an additional evaluation to inform the recommendation regarding the need for additional modeling in the area surrounding this source.

The air program obtained the hourly emission profile from the Asbury unit in 2019 as well as the hourly emission profiles from the facility in the modeled years (2012-2014). The air program then determined the maximum daily hourly emission rates from the facility during these years and plotted the results to provide a comparison between the 2019 emission levels and the emission levels during the modeled years. This plot is provided in Figure 1. As seen in the figure, the maximum daily hourly emission rates from the facility during 2019 (displayed as the yellow line in the figure) are consistently lower than the maximum daily hourly emission rates during the modeled years that demonstrated attainment. This provides even further assurance that additional modeling would show continued attainment in the area surrounding the Asbury facility. Finally, the air program notes the facility has not operated in 2020 and the facility officially retired on March 31, 2020. Therefore, no SO₂ emissions are expected from this facility going forward. For all of these reasons, the air program recommends no additional modeling for the area surrounding the Asbury facility.

Figure 1 – Maximum Daily Hourly Emission Profiles at Asbury - Modeled Years vs. 2019



Montrose, Henry County - FIPS 083-0001

This facility had no SO₂ emissions in 2019. All three units at the facility are now retired. Unit 1 retired in April 2016, while Units 2 and 3 retired in December 2018. Going forward, no SO₂ emissions are expected from this facility. Therefore, the air program recommends no additional modeling for the area surrounding the Montrose facility.

Meramec, St. Louis County - FIPS 189-0010

For this facility, annual SO₂ emissions in 2019 were 4,146 tons/year less than the average annual modeled emissions from 2013-2015. This is a decrease of 75 percent between current actual emissions and the emissions the air program modeled to inform the original attainment designation. Since annual emissions in 2019 were significantly lower than the emissions used in the modeling analysis that demonstrated attainment, any updated modeling is expected to result in even lower modeled SO₂ concentrations that would also demonstrate continued attainment in the area surrounding this source. Therefore, the air program recommends no additional modeling for the area surrounding the Meramec facility.

City Utilities John Twitty, Greene County - FIPS 077-0039

For this facility, annual SO₂ emissions in 2019 were 1,201 tons/year less than the average annual modeled emissions from 2013-2015. This is a decrease of 44 percent between current actual emissions and the emissions the air program modeled to inform the original attainment designation. Since annual emissions in 2019 were lower than the emissions used in the modeling analysis that demonstrated attainment, any updated modeling is expected to result in even lower modeled SO₂ concentrations that would also demonstrate continued attainment in the area.

surrounding this source. Therefore, the air program recommends no additional modeling for the area surrounding the City Utilities John Twitty facility.

Thomas Hill, Randolph County - FIPS 175 0001

For this facility, annual SO₂ emissions in 2019 were 115 tons/year more than the average annual modeled emissions from 2013-2015. This is an increase of 0.6 percent between current actual emissions and the emissions the air program modeled to inform the original attainment designation.

Since annual emissions in 2019 were slightly higher than the emissions used in the modeling analysis that demonstrated attainment, the air program evaluated the level of the maximum modeled design value in the area that was used to inform the original attainment designation. As provided above in Table 4, the maximum modeled SO₂ design value in the area surrounding this facility for 2013-2015 was 52.3 ppb. This modeled design value is 69 percent of the level of the SO₂ standard (75 ppb). Taking into consideration the very small emissions increase between current actual emissions and the modeled emissions along with the previous modeling showing less than 70 percent of the level of the standard, any additional modeling is expected to similarly demonstrate continued attainment in the area surrounding this source. Therefore, the air program recommends no additional modeling for the area surrounding the Thomas Hill facility.

Public Inspection and Review

As required in 40 CFR 51.1205, the air program will make the final stand-alone report available for public inspection and review on our public website. The final report will also be available for review at the Missouri Department of Natural Resources, Air Pollution Control Program, 1659 Elm St., Jefferson City, (573) 751-4817.

The air program also made a proposed version of the report available for public review and comment prior to finalizing it, specifically –

- Notice of the availability of the proposed stand-alone ongoing data requirements report was posted on the program website by May 15, 2020.
- The air program opened a 30-day public comment period for the proposed report on May 15, 2020 after posting it on the website. The public comment period closed on June 15, 2020.
- After posting the proposed report, the air program sent an email announcement to notify the public of the availability of the report and the corresponding public inspection and comment period. Email recipients included all individuals who have signed up to receive email updates for air program public notices.

Conclusion

This report fulfills the air program's obligation to submit an annual ongoing data requirements report for Missouri's modeled DRR sources. The report includes an evaluation of the most current year of emissions data at the modeled sources, an assessment of the cause of any SO₂ emission increases at these sources from the previous year and the air program's recommendations regarding the need for additional modeling to evaluate the continued attainment status for the areas surrounding these sources. The air program recommends no additional modeling is needed for any of Missouri's six modeled DRR sources.